



# the crest

THE RESEARCH, TEACHING AND HEALTH CARE MAGAZINE OF THE ONTARIO VETERINARY COLLEGE



## Practice Makes Progress

OVC's new state-of-the art facility will further enhance its approach to hands-on, experiential learning and commitment to innovative clinical skills training programs

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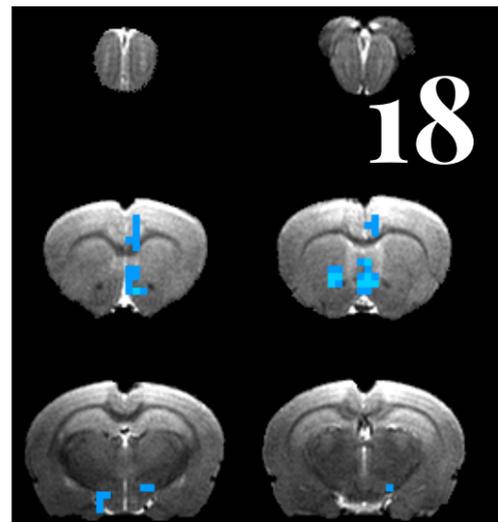
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The Crest is the research, teaching and health care magazine of the University of Guelph's Ontario Veterinary College.

#### crest magazine

The Crest is published two times per year by OVC for alumni, friends and partners of the college to share our collective strengths in evidence-based discovery, veterinary expertise and educating the next generation of leaders in animal, human and environmental health.

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## From the Dean

**C**ontinuous improvement is key to everything we do at the Ontario Veterinary College; it can be seen in our student-centred curriculum, our innovative research programs, the leading-edge

care we provide to patients and in the new facilities where we teach, discover and learn.

This drive to improve life is one of the key contributing factors to our continued recognition as the top veterinary school in Canada and fifth worldwide in the 2021 Worldwide University Rankings by Quacquarelli Symonds (QS).

The rankings are based on a multitude of factors including overall research impact and academic and institutional reputation and are intended to help prospective students identify leading schools in their field.

Notwithstanding the many challenges we and our broader community have faced in the past 18 months, OVC continues to excel on all these fronts, and I take great pride in the leading example we set, our commitment to serve, and the impressive results we achieve as a community of scholars, students, researchers, educators, and professionals.

Last fall we welcomed the first cohort of OVC students to our new Enhanced Clinical Skills teaching space. This state-of-the-art space further strengthens our technical and skills training for student veterinarians. Here, students have a dedicated space to learn and practice these skill sets, including surgical instrument handling, suturing, dentistry skills and clinical communication, allowing them to gradually increase their proficiency and their confidence.

There have been many positive notes this past year, with innovative research findings, new faculty members bringing unique expertise to our college, continued support for our world-class academic and research programs, and the completion of renovations to the anesthesia, endoscopy and surgical facilities in the OVC Health Sciences Centre.

We look forward to the day when we can welcome you back to OVC. In the meantime, stay safe and be well.

Dr. Jeffrey Wichtel, BVSc, PhD, Dip. ACT  
Professor and Dean, Ontario Veterinary College

### EQUITY, DIVERSITY AND INCLUSION AT OVC



OVC is strengthening its commitment to equity, diversity and inclusion with a newly developed strategy designed to ensure the college offers a safe, welcoming, and inclusive environment for all. OVC engaged HRx Technology, a Canadian firm that provides training, consulting, and data analytics to enable equity, diversity, and inclusion in the workplace. HRx will help OVC develop a comprehensive and actionable Equity, Diversity and Inclusion (EDI) strategy that enhances diversity in our academic, research and healthcare programs.

One important element of this work was in-depth consultation, including focus groups and an anonymous online survey, with alumni, faculty, staff and students to better understand the demographics and experiences of the broad OVC community.

HRx will analyze this information, to outline key findings and inform a full-five-year EDI Strategy with prioritized short, medium and long-term goals and targets. Watch the OVC website (ovc.uoguelph.ca) for more information. 🇺🇸

## DR. JEFF WICHTEL REAPPOINTED OVC DEAN

In November of 2020, Prof. Jeff Wichtel was reappointed dean of the Ontario Veterinary College (OVC) for a five-year term.

During his first term, Wichtel further strengthened OVC's teaching and research, including launching initiatives intended to enhance animal health care and education. He was able to build a strong network of external relationships with the agri-food sector, alumni, donors, government and industry partners, as well as veterinary corporate partners focused on improving companion animal health.

With the aim to build further external relations for the college, Wichtel has secured notable philanthropic support for research and teaching facilities, training, diagnostic tools, student well-being and experiential learning, veterinary mental health research and scholarships and bursaries.

Under Wichtel's leadership and working with industry partners, OVC has created the Animal Health Partners Chair in Veterinary Medical Innovation, a new scholarly chair to accelerate the translation of veterinary medical innovations from laboratory to patient.

Throughout the COVID-19 pandemic, Wichtel empowered the OVC leadership team to pivot teaching approaches, maintain time-sensitive research and deliver essential animal services. 🇺🇸



## THE GROWING DEMAND FOR VETERINARIANS

As Ontario's population continues to grow – and the demand for veterinary services follows suit – graduating DVM classes entering the job market are well-positioned for professional success. Results of a 2020 study by the Canadian Veterinary Medical Association confirmed that demand for veterinary services has or will soon exceed capacity in most parts of Canada. The COVID-19 pandemic has compounded the issue as practices integrate public health measures into care.

The Ontario Veterinary College (OVC), the College of Veterinarians of Ontario (CVO) and the Ontario Veterinary Medical Association (OVMA) are working together on measures to help address the shortage of veterinarians across the province, and to help public and veterinary healthcare teams adapt to the mismatch in demand and capacity for veterinary services.

Some of this work is already underway. OVC is currently in discussion with public and private sector stakeholders on a range of topics relevant to veterinary training. The CVO and OVMA are looking at opportunities to enable veterinarians to better utilize the knowledge and skills of veterinary technicians. As well, exploring options for after-hours care and the delivery of emergency veterinary services are important considerations.

Other strategies to consider include: increasing domestic training capacity and increasing efforts to recruit veterinarians trained outside of Ontario; increasing the use of digital tools, such as telemedicine; supporting the business sustainability of practices and emergency services in under-served regions of Ontario; and providing incentives to encourage veterinarians to train and work in parts of the province experiencing poor access to care.

While few of these options can be implemented immediately, as leaders in the veterinary profession in Ontario, the OVC, the CVO, and the OVMA are exploring all options to ensure the public's access to safe, quality veterinary medicine. 🇺🇪

OF NOTE



## OVC AND U OF G'S NEW COMBINED DEGREE PROGRAM

A new, combined degree program that pairs existing Doctor of Veterinary Medicine (DVM) and Master of Public Health (MPH) programs was recently announced at the University of Guelph and Ontario Veterinary College. The new DVM/MPH program allows student veterinarians to complete both a DVM and MPH degree in a reduced overall number of semesters.

The combined DVM/MPH program will provide future veterinary graduates with formal training in public health in addition to their veterinary medical training. Veterinarians with MPH degrees are increasingly recognized for their involvement in all areas of public health, including epidemiology, environmental health, as well as infectious disease investigation and control. They are uniquely qualified to understand and respond to emerging zoonotic diseases, address global food system problems, and contribute to building resilient and healthy communities.

The DVM/MPH program is intended to support future graduates working in traditional clinical settings, as well as those who wish to pursue alternative careers in public or animal health. See [onehealth.uoguelph.ca/dvm-mph/](https://onehealth.uoguelph.ca/dvm-mp/) for more information. 🇺🇪



## KNOWLEDGE ENGINE WILL GATHER DATA ON ANIMAL DISEASE AND HEALTH

Two University of Guelph researchers will help build a global information system that will underpin efforts to evaluate the burden of livestock disease and health issues around the world. Dr. Theresa Bernardo, the IDEXX Chair in Emerging Technologies and Preventive Healthcare in U of G's Ontario Veterinary College, and Dr. Deborah Stacey, from the School of Computer Science, have been named as co-leads of the Informatics theme of The Global Burden of Animal Diseases (GBADs) program. Their task is to help assemble a self-sustaining "knowledge engine" that will gather and disseminate data on animal disease and health.

By assessing the global burden in economic terms, the GBADs programme, led by the University of Liverpool, the World Organisation for Animal Health (OIE) and a partnership of international institutions, will contribute to the Sustainable Development Goals, identifying affected individuals and communities, demonstrating how animal health is intrinsically linked to agricultural productivity, smallholder household income, the empowerment of women and the equitable provision of a safe, affordable, nutritious diet. 🇺🇪



## OVC HISTORY THROUGH THE GLASS

Two new pieces of stained glass in the Ontario Veterinary College's (OVC) main administrative building provide a visual tribute to OVC's history.

OVC Biomedical Sciences professor Brad Hanna has created a number of stained glass pieces throughout the college. In 2005, he created two panels for the OVC Main Building that included 'placeholder' roosters. This year, in advance of OVC celebrating 100 years in Guelph in 2022, Hanna created two new pieces to replace the roosters: one depicting a horse with the inscription, 'Ontario Veterinary College, Founded 1862' and a second depicting a bull with 'OVC One Hundred Years in Guelph, 1922-2022.'

"The horse symbolizes the main work of the veterinarian when the college was founded (transportation), the bull symbolizes the main thrust of veterinary medicine when OVC moved to Guelph (agriculture), and the checkered borders show the OVC school colours: black and white," says Hanna. "The bull and horse are both famous Ontario animals from the late nineteenth century, which I took from the 1881 Ontario Agricultural Commission Report."

In creating the artwork, Hanna used traditional stained glass techniques – the same techniques that were used to make European cathedral windows. By applying silver and heating the glass in a kiln to 1,040 F, the silver atoms enter the glass and 'stain' it amber or gold. The black and blue paints are metal pigments that adhere to the glass when heated to 1,250 F. 🇺🇪



## NEW U OF G DAIRY CENTRE AMPLIFIES RESEARCH AND INNOVATION

The University of Guelph is a powerhouse when it comes to dairy research, with internationally recognized researchers and interdisciplinary research across the campus.

Dairy at Guelph: The Centre for Dairy Research and Innovation is an important component in this work, bringing together more than 60 U of G faculty, including many internationally recognized experts, studying a wide range of dairy subjects.

The Dairy at Guelph interdisciplinary research network led the way to the establishment of the centre in 2020, bringing together researchers and graduate students studying animal health and welfare, genetics, nutrition, reproduction, dairy foods and human nutrition.

The new centre will amplify collaboration, promote U of G research and innovation and train the next generation of world-leading dairy researchers to meet industry needs. 🇺🇪



## PEOPLE: EXPERTISE EXPANDS AT OVC

**Dr. Michelle Oblak**, Animal Health Partners Research Chair in Veterinary Medical Innovation, veterinary surgical oncologist and associate professor in OVC's Department of Clinical Studies, and **Geoff Wood**, a cancer researcher and associate professor in OVC's Department of Pathobiology, took the helm as co-directors of the U of G's Institute of Comparative Cancer Investigation (ICCI) in 2020. Combining the expertise of researchers in basic cancer biology and clinicians in veterinary medicine, ICCI captures the U of G and OVC's unique strengths to broaden the scope of research and deepen understanding of cancer in pets and people.

**Dr. Theresa Bernardo**, IDEXX Chair in Emerging Technologies and Preventive Healthcare, focuses on tackling challenges in accessing and integrating veterinary health data from various sources, demonstrating practical use of data for patient health monitoring and preparing veterinarians for success in a tech-enabled world. A \$1.5-million funding renewal from IDEXX Laboratories Inc will support a further five years of training of highly qualified personnel in the growing area of health informatics in veterinary medicine.

Improving lives of pets, veterinary clients and veterinary teams through communication and relationship-building is the goal of the new \$1-million VCA Canada Chair in Relationship-Centred Veterinary Medicine. Awarded to OVC's **Dr. Jason Coe**, a leading expert in veterinary clinical communications and a professor in the Department of Population Medicine, the new position will foster research and teaching in communication and relationship-building to improve the health of companion animals and develop new practice models for more sustainable business operations and enhanced mental health and well-being for veterinary teams.

**Dr. Caitlin Grant** joins OVC in the new role of Nestlé Purina Professorship in Companion Animal Nutrition, to enhance veterinary students' education in companion animal clinical nutrition, broaden research in pet nutrition and expand opportunities to share information with pet owners and practising veterinarians. Grant's faculty appointment will make OVC the only Canadian veterinary college with two specialists in companion animal nutrition.

A new Canada Research Chair in One Health will focus on water and health challenges at the animal, human and environmental interface. **Dr. Heather Murphy**, in OVC's Department of Pathobiology, focuses her water and health research on reducing preventable waterborne diseases through applied research.

The U of G's world-renowned **Saputo Dairy Care Program**, delivered by OVC, went virtual in 2020. The week-long elective rotation provides final-year student veterinarians from across Canada and abroad the opportunity to discuss key areas of dairy cattle welfare in a safe and supportive environment, combining theory and practical animal welfare applications equipping veterinary students with the skills needed in their profession. The program was recently renewed and expanded thanks to a \$750,000 contribution over five years from Saputo Inc. The funding supports intensive learning in dairy cattle welfare for final-year student veterinarians from across Canada and abroad. 🇺🇪



# TRAINING FOR COMPLEXITY

Looking back on the development of One Health

**Veterinarians have always played an important role in protecting public health. Now, against the backdrop of a global pandemic caused by a zoonotic pathogen, we have been once again reminded of the interconnectedness between animal and human health.**

For decades, researchers at the Ontario Veterinary College (OVC) have studied the relationships between global health systems, spanning human, animal, and environmental health. Over time, ecosystem health became a recognized academic field, gaining significant momentum in the 1990s.

Ecosystem health is by its very nature collaborative, taking a co-operative approach to understanding and promoting human health and well-being in the context of complex social and ecological interactions. This work serves as the foundation for the concept of One Health.

Dr. David Waltner-Toews, U of G professor emeritus and author, credits Dr. Ole Nielsen, OVC Dean from 1985 to 1994, for the innovative leadership that helped place OVC on the map as an acknowledged leader in the field of integrative approaches to animal, human and ecosystem health.

Nielsen first became interested in environmental health while serving as Dean at the Western College of Veterinary Medicine in

Saskatchewan. His research group encountered alkyl mercury poisoning in pigs which prompted further research that resulted in the first documentation of mercury pollution in a Canadian river.

In 1991 Nielsen used an administrative leave and a grant from a federal advisory council for science and technology to investigate how the concept of health could be more widely applied to the environment. While the term environmental health was commonly used at the time it generally referred to toxicological issues, notes Nielsen.

“I came to realize it was essential to define the meaning of health so that it can be applied at the ecosystem level. In short, the ecosystem approach is essential to manage health,” he adds.

He advocated for a more central role for this approach in veterinary medicine, first in an article in the Canadian Veterinary Journal in 1992, and then later in other publications. “To the best of my knowledge, this was the first such advocacy in a veterinary publication,” says Nielsen.

“I came to the conclusion that the scope of veterinary medicine, simply put, encompasses the health of animals, people and ecosystems (One Health),” says Nielsen. “This is an enormous challenge and one that veterinary medicine is well suited, and I would add, obliged, to tackle given its foundation in biology and comparative medicine.”

He encouraged and worked with OVC faculty members Waltner-Toews (Population Medicine) and Dr. Bruce Hunter (Pathobiology), who were similarly interested in the ecosystem health concept.

Waltner-Toews then led an interdisciplinary group at the U of G who successfully acquired grants for agricultural ecosystem health research and established relationships with University of Waterloo researchers working in parallel on the concept of ecosystem integrity.

To introduce these concepts to student veterinarians, Hunter and Waltner-Toews, were the driving force for the creation of an Ecosystem Health rotation for final year Doctor of Veterinary Medicine (DVM) students. The rotation is

held in conjunction with veterinary faculty across Canada and remains part of OVC’s curriculum today. The course exposes students from across Canada and from international colleges of veterinary medicine to complex real-world problems and provides hands-on training in the work necessary to manage these issues and develop solutions.

Waltner-Toews points to numerous initiatives that further expanded growth in this area. “We became founding members of the CoPEH-Canada (Community Approaches to Ecohealth). We wrote manuals for teaching these new approaches both in Canada and internationally, led major research projects on West Nile, Lyme Disease, Avian Influenza and agro-ecosystem health, and were the driving force for the establishment of Veterinarians Without Borders - Canada, an international development organization which explicitly takes an ecohealth - One Health approach.”

He also highlights the importance of the establishment of the Canadian Cooperative Wildlife Health Centre (CWHC) in 1992 with its focus on wildlife health. Wildlife can have a significant impact on ecosystem health as they can be carriers of parasites or diseases that can be migrated to new geographies, transferred to other animals or even humans. The CWHC now has nodes at each of the veterinary colleges across Canada, with the Ontario/Nunavut Regional node at OVC.

The development of these training programs has been instrumental in effecting change and making an impact on the complex health issues we face. Graduates become valued collaborators and advocates of One Health concepts. Waltner-Toews notes that OVC DVM 2000 alumna Enid Stiles, past president of the Canadian Veterinary Medical Association, was a founding member of Veterinarians Without Borders, and Dominique Charron, an OVC DVM 1990 graduate who completed her PhD with Waltner-Toews, headed the Ecosystem and Human Health program with Canada’s International Develop-

ment Research Centre, and is now its Vice President, Programs and Partnerships.

This early work provided the momentum for adopting One Health as a central strategic pillar for OVC. Global health conferences were hosted at U of G in 2012 and 2014. Notable expansion of public health research and training ensued, including the establishment of a new centre of excellence, Centre for Public Health and Zoonosis, in 2006, previously led by Dr. Jan Sargeant and now Dr. Scott Weese. Over time, OVC launched a full range of public health degree programs including the Masters in Public Health and the combined DVM-MPH.

The U of G One Health Institute (OHI), established in 2019, is further encouraging scholarship and developing graduates to lead in One Health approaches, engaging the entire U of G campus and beyond, realizing the long-held goal of true interdisciplinary collaboration.

The U of G OHI “looks very well-conceived and executed. I pass on my compliments to Dean Jeff Wichtel and his colleagues on the university’s initiative. The OHI is ideally positioned to be a world leader in promoting ecosystem health,” notes Nielsen.

One Health can be a difficult concept to grasp, “Part of the challenge is the complex nature of the problems; there’s no one way to frame them or address them. An answer that seems simple suddenly isn’t so simple anymore,” says Waltner-Toews.

The collaborative nature of One Health work is integral to finding those answers. “Nobody can encompass everything,” he notes. “The way to approach such complex issues is through collaboration.”

The concept of ecosystem health did not come to the fore until the early nineties and later, when the University of Guelph had a significant hand in promoting this approach, notes Nielsen. One Health emerged as a popular unifying concept about a decade later and grew out of ideas expressed by Calvin Schwabe related to one medicine and has incorporated ecosystem health along with human and animal health.

As Associate Dean, Students and Academic (ADSA) for the Ontario Veterinary College, Dr. Joanne Hewson's title may be succinct, but her portfolio covers a broad area.

In her role as a key member of the OVC senior leadership team, Hewson is responsible for providing leadership in advancing the academic, professional and personal development of students in the Doctor of Veterinary Medicine (DVM) program, curricular innovation and oversight, as well as DVM student recruitment and career readiness.

Maintaining calm in the face of uncertainty was another leading feature of Hewson's job description that rose to the forefront during the COVID-19 pandemic. In her ADSA role, Hewson was frequently in touch with students in all four phases of the DVM program at OVC and all instructors, at every stage of the pandemic and now throughout the recovery phase.

As communication needs of the students and faculty evolved over the pandemic, Hewson took great care to adapt ways of receiving input from everyone and sought to understand new challenges and barriers as they emerged, so that solutions could be identified through shared conversation.

"The saying that it takes a village is certainly true" says Hewson, "So many student leaders, faculty, staff and administrative members of the OVC team each played key roles in keeping communication channels open and supportive. I am proud of the ways in which our OVC community has stayed empathetic with each other, as we

Associate Dean portfolio in fall 2018.

Adds Hewson, "Every time I connect with the students, it re-energizes me, so it's exciting to maintain teaching as part of my job."

Indeed, she continued to deliver significant in-person skills training to student veterinarians throughout the pandemic as well. "By being an instructor on the front line, ensuring essential skills training was continued so that our student veterinarians could progress in their program in meaningful ways despite the pandemic, I was able to deeply understand the needs of other instructors and personally connect with students. We were able to implement carefully crafted safety plans and deliver training while maintaining a safe learning environment for all."

She worked with faculty to help transition courses to a remote format and safely deliver hands-on skills labs to DVM students. She also worked with the admissions team to pivot to an online situational judgement test for applicants, along with virtual interviews, to replace the traditional face-to-face Multiple Mini Interviews.

Despite the constant need to manage pandemic-related challenges to the DVM program, Hewson has also remained actively involved in leading a variety of initiatives related to curricular design and redesign, and supported faculty seeking to expand their teaching strengths or to enhance student training.

"The University as a whole has made great strides towards allowing faculty who feel very passionate about their teaching to excel in that area, do

competency-based skill set and assure continual accreditation success for the college.

An important component in the learning process is focused on helping student veterinarians to actively reflect on the skills they are learning and the ways they can use them.

Hewson believes this reflection piece, directly embedded in the concept of experiential learning, is a critical component in the learner-centred approach of OVC's DVM program.

"This not only expands student learning, it enhances confidence and also helps students be more prepared to make career changes if the opportunity presents itself and go where their passions take them," she adds. "I think that's really the take home message of a veterinary school: We teach you how to learn so that you can make change in the future and be confident that you will be successful."

Over the past three years, under Hewson's leadership, the ASDA team has expanded to enhance work in the key areas of experiential learning and job readiness through the addition of a Learning Pathways Officer, and in well-being through an OVC Director of Well-Being Programming.

"The intent with this latter role is to enhance the knowledge and practice of well-being across OVC using evidence-based approaches on how to best support and help our students be resilient and practice self-care," adds Hewson.

As a guiding principle in her ADSA role, Hewson has remained committed to seeing students succeed while main-

"It's about making sure our students are ready for the next 20 years so that, as a profession, our graduates can remain resilient, flexible and nimble to the changing times."



# ADVANCING STUDENT SUCCESS

Dr. Joanne Hewson's commitment to teaching, community well-being and the student experience

worked through some incredibly significant pinch-points together."

Hewson's leadership through the pandemic is a reflection of her lifelong commitment to teaching, student well-being and to the student experience. A Large Animal Internal Medicine faculty member in the Department of Clinical Studies, Hewson, OVC DVM 1996 and PhD 2003, has continued to teach in the DVM program since her appointment to the

research in that area, publish in that area and make that their career focus," says Hewson. "I think that's been a really key thing that's allowed me to take the path I've taken to where I am today, and now my role is to enable others."

She is also excited to help craft the vision and next steps for the continually evolving DVM curriculum.

Steady refinements to the curriculum ensure students receive a

taining high-quality training, curricular excellence, and delivering a student experience that embraces people's differences and is founded in compassion. "It's not only about what we teach students in the four years that they are with us," says Hewson. "It's about making sure they're ready for the next 20 years so that, as a profession, our graduates can remain resilient, flexible and nimble to the changing times." 🌱

IN PHOTO: Dr. Joanne Hewson, Associate Dean Student and Academic at the Ontario Veterinary College, University of Guelph. Photo credit: Spencer McMillan.



# Practice Makes Progress

OVC opens doors to new state-of-the-art facility for clinical skills training

A new state-of-the-art facility, which opened to students in fall 2020, will further enhance the Ontario Veterinary College's (OVC) approach to hands-on, experiential learning and commitment to innovative training programs.

The new Enhanced Clinical Skills Addition provides students with access to a dedicated clinical skills space, new communications teaching labs, and flexible teaching space for adaptive approaches to learning.

The clinical skills space will also provide students with the opportunity to access a library of clinical models to improve their capability outside of class hours, if they wish, further enhancing OVC's student-centered approach.

Communication labs have been configured as exam rooms, providing students with a realistic space to practice client-veterinarian conversations.

The new space has been designed to accommodate small group discussions and meetings among student veterinarian practice groups, providing more opportunities for students to network and connect, and fostering informal learning.

There has been a ripple effect with the opening of the new building, with the temporary classroom on the second floor of the main OVC building being subsequently converted to a lounge space for DVM students.

"It's a space for students to decompress, be social and have the opportunity to step away from their learning temporarily and resettle their minds before they jump back into studying or attending classes," says Dr. Joanne Hewson, Associate Dean, Students and Academic. "I think that lounge space will be critical as we continue to focus our efforts in the realm of student well-being."

Photo credit: Jane Dawkins

## What is a Clinical Skills Learning Model?

Clinical skills models come in all shapes and sizes, literally. Many in use in OVC's clinical skills labs were developed in-house by instructors to meet their students' particular needs.

Since the Dog Abdominal Surrogate for Instructional Exercises model – DASIE for short – was introduced in their surgery course to help students develop their surgical and suturing skills (see back cover), simulation models have continued to be an important component in clinical skills training.

The DASIE model remains a mainstay in the clinical skills curriculum with each first-year student provided a model by Boehringer Ingelheim.

In their second year of the OVC DVM program, student veterinarians build a spay model crafted from beads for ovaries, yarn for the uterus and artificial suede cord, which they then must use to practice the steps for an ovariohysterectomy procedure using their DASIE model under faculty supervision. Developed by Clinical Studies professor Dr. Brigitte Brisson, the models help students understand the uterine anatomy and gain confidence with this procedure prior to live animal surgery.

"Many of the materials and models we use in our labs emulate real life," says Brisson. "Giving students the ability to learn without the stress of moving from a textbook directly to a real patient allows them to practice and build confidence."

"We have 3-D printed model cat and dog legs for practicing intravenous catheterization developed through collaboration with the School of Engineering," says Dr. Andria Joy, coordinator of clinical skills training in the Department of Clinical Studies.

Students also practice incisional and excisional biopsy skills with oncology silicone models created by Dr. Michelle Oblak, a surgical oncologist and Clinical Studies associate professor. The silicone models include masses, simulated skin, fascia, and muscle layers to provide students with a realistic example.

Recently, Clinical Studies professor and anesthesiologist Dr. Carolyn Kerr worked with Claudia Smith, a PhD student from the School of Engineering, to create a 3-D printed model of a cat. The model permits students to practice tracheal intubation, a procedure that allows for the delivery of anesthetics and oxygen to the lungs through a tracheal tube. Intubation is a key skill and an important task for students to master before they move on to performing general anesthesia on veterinary patients.

Another recent addition is a bovine paravertebral block model, built with assistance from engineering graduate student Michael Lissemore. Equipped with sensors embedded in silicone, the model is used to teach students how to administer a paravertebral nerve block, frequently used to permit surgery in cattle in the field. Learning how to do nerve blocks in standing cattle can be challenging, and the models help students develop confidence, notes Joy.

"We made a giant sheet of silicone that is thicker at one

end and thinner at the other to replicate the muscles of a cow's back, one model slightly thicker to simulate a beef cow and one slightly thinner to simulate a dairy cow."

The sensors placed within the silicone model mimic the nerve location and light up when students administer the needle with the nerve block to the correct spot, providing them with immediate, positive feedback.

"The fact that the college is committing time and resources towards building these models has been a major pedagogical shift – a very exciting one – towards enhancing student proficiency and confidence in their learning," says Hewson.

Beyond the clinical skills lab in the Enhanced Clinical Skills Addition, models are often incorporated into teaching, from an udder to teach how to collect a milk sample from a teat, to scoring models for sheep that help train students to assess body condition, to a full-size horse model donated by the Equine Foundation of Canada and incorporated into the curriculum in 2018. In addition to an anatomically correct reproductive tract, the advanced horse model includes the spleen, kidneys, and digestive tract so students can palpate for normal and colic conditions. Students can also practice intramuscular injections, as well as jugular venipuncture for blood sampling (of imitation blood) on this equine model.



Photo credit: Jane Dawkins

**"The benefit of hands-on practice with models is that we can practice in a safe, controlled environment. Sometimes the best thing we can do in these labs is to make mistakes, so we can see exactly how easy it is to make a mistake, and then learn from it," says Sydney Graham, OVC Class of 2023.**

Infrastructure renewal at the Ontario Veterinary College (OVC), including the new spaces for enhanced clinical teaching and learning, as well as advanced surgery and anesthesia facilities in the OVC Health Sciences Centre, have been made possible by a \$23 million investment from the provincial government, announced in March 2016.

# Building the clinical communication skill set

Communication touches every aspect of veterinary medicine from client to team interactions. Just as technical skills are honed by repeated practice, continual refinement of clinical communication skills is a critical component in building the student veterinarian's skill set.

Clinical communications has been a core component of the Ontario Veterinary College's DVM curriculum since 2000. Student veterinarians focus on communication skills scaffolded across each year of the program, through training that involves simulated interactions with clients.

"Our communications program is a strength of the college and our students have excellent opportunities for training and practicing their skills in this area," says Hewson.

OVC was the first veterinary school in North America to include clinical communication as a core competency across all four years of the DVM curriculum, says Dr. Jason Coe, a professor in the Department of Population Medicine and coordinator for the clinical communication curriculum. A leading expert in veterinary clinical communication, Coe has established an active research program examining human-animal relationships as well as the role of interpersonal communications on the outcomes of veterinary care.

Student veterinarians gradually expand their communications tool kit over the four-year DVM program. The first year focuses on increasing their awareness of communication as a clinical skill set, including lectures introducing different communications skills and strategies, and bringing them into labs for some initial contacts with simulated clients.

Second-year students get into more complex conversations around topics such as the cost of veterinary care, breaking bad news and navigating informed consent, while third-year students delve into more difficult conversations such as end-of-life discussions.

Videos of their simulated client interactions are an important tool for students, allowing them to reflect on things that worked well and areas they might change.

"It really is about setting students up with a foundation of knowledge and then having it modelled and

reinforced in different areas of the college," says Coe.

In the new clinical skills facility, the communication labs are structured like exam rooms students would find in practice, "so it's more realistic for them when they're doing their simulated client experiences," says Hewson.

The exam room configuration also provides more touch points for hands-on practice, notes Coe. He plans to take advantage of the proximity to the clinical skills space and incorporate clinical models into the simulated client sessions, giving students an opportunity to work on team communications when completing technical skills during procedures.

While the COVID-19 pandemic pushed the communication curriculum online for the 2020-2021 academic year, it also provided some positive opportunities.

"It created some good opportunities to talk about how we engage virtually with a client," says Coe. "As we go back to whatever becomes the new normal, we want to retain some of what we've been doing from a virtual standpoint, because I imagine in veterinary care there will be more virtual touchpoints post-COVID than there were previously."

One of the strengths of OVC's communications curriculum is an active and formalized research program looking at communication in veterinary practice. "We are able to introduce research evidence before publication on things we can incorporate into our engagement with clients and better understand how that influences the trajectory of the interaction with both the client and patient," says Coe.

Coe, who was recently named the VCA Canada Chair in Relationship-Centred Veterinary Medicine, plans to further explore ways to support long-term relationship-building among clients and veterinary team members, and how to incorporate new research into practice and teaching.

Adds Coe, "Our focus is to support students with transferable skills, whether they are using those communication tools in a veterinary-client interaction or applying them to communications within their veterinary team."



## Dentistry

The OVC clinical skills training for DVMs has expanded again over the last two years with the addition of dentistry labs as a direct response to requests from alumni and employers.

First introduced in early 2019, the second-year labs feature high-fidelity dentistry models and dentistry stations to provide students with hands-on practice in dental exams, cleaning and tooth extraction skills.

"Each of these models, manufactured by Veterinary Simulator Industries, are a work of art and take meticulous manufacturing," says Joy. Along with the models are five new Disposed dental machines, made possible in part with a \$100,000 sponsorship from VetStrategy.

The dentistry labs focus on prevention and treatment, with students learning how to use an ultrasonic scaler, a polisher and gain experience with all the basic dental hand instruments, dental radiographs and local anesthetic blocks.

The sophistication of the models allows the students to perform all three types of extractions: single root, multiple tooth extraction and surgical or complicated extraction, with gingival flaps including elevation of the periosteum.

"We present clinical scenarios that students will see in practice," adds Joy. "Periodontal disease occurs in 70 per cent of patients, so this is critical information for our graduates to know."

Client education is another key component of these labs. "Clients may not appreciate the importance of dental care to an animal's overall health, or they may be confused or resistant to preventative care and treatment," says Joy. "Students need to have an understanding of dental disease and dentistry to have the answers for the kinds of questions they will hear when they enter practice."

## Deliberate practice and a stepwise approach

Deliberate practice and self-reflection are important focus areas in learning vital technical skills. So too, is a stepwise approach.

In addition to fundamental courses in principles of disease and clinical medicine during their first three years of study, DVM students at OVC focus on developing the technical and clinical skills they need to accompany this knowledge.

In OVC's clinical skills labs, complex technical or psychomotor skills are broken down into simpler tasks so students can gain competency before stepping up to the next level, explains Kerr.

Over the past several years, Brisson has transitioned the classroom-based principles of surgery curriculum into a hands-on skills lab. Beginning in their first year, students are introduced to basic surgical skills such as instrument handling and suture patterns. Second-year students learn about surgical asepsis including patient and surgeon preparation, gowning and draping skills through a variety of lab-based exercises.

They also learn and practice more advanced skills such as bandaging, principles of oncologic surgery, dentistry and spay and neuter procedures.

Students progressively build their technical skills, beginning with low-fidelity foam and silicone models which achieve the objective of learning suturing skills. More complex high-fidelity models are used to teach and refine skills such as orotracheal intubation for anesthesia.

With models, students can practice a procedure or process multiple times until they are comfortable, increasing their competence and confidence.

Encouraging repeated deliberate practice with targeted feedback and reflective learning encourages students to learn to self-assess their skills, adds Kerr.

"We want the clinical skills lab to be a welcoming place where it's perfectly okay to make mistakes," says Joy. "We stress the difference between practice and deliberate practice. Practice is repeating something

again and again. Deliberate practice is really evaluating what you just did, determining what's good about it, what did not work well, and what you can do to improve. That's the whole philosophy of experiential learning."

Developing the ability to self-assess and become self-directed learners is a crucial skill for DVMs, notes Kerr.

Video capture also will be available in the new Enhanced Clinical Skills Addition and will further expand these opportunities. "If you are a golf pro or a hockey player, you analyze your performance," adds Kerr. "The same approach benefits veterinarians and student veterinarians."

Both employers and trainees are interested in Day 1 'job ready skills' in anesthesia, diagnostic imaging, medicine and surgery.

Adds Kerr, "The breadth of skills provided by veterinarians keeps expanding. As educators, we need to continue to evolve and expand our skills training over time to continue to improve our graduates and ultimately patient outcomes." 🐾



**From his roots as a small animal veterinarian to his appointment as the Associate Deputy Minister of Health Canada (with many adventures in between!), Dr. Harpreet Kochhar's career is proof 'you never know where a degree in veterinary medicine will take you.'**

## *In conversation with...* **Dr. Harpreet Kochhar**

One Health brings diverse perspectives to problem solving. As a veterinarian, what would you like Canadians to understand about One Health, and can you describe how you have seen this approach in action and how it improves outcomes for your patients?

A classic definition of One Health recognizes that the health of people is closely connected with the health of the environment, the health of animals and the shared environment. People probably do understand this concept, but we all think in silos - even big policy makers and researchers. When we are faced with a crisis like a pandemic, our focus is on preventing disease spread and making sure we are able to find vaccines. This type of focus is important in what we might call the wartime; the focus will be different during peacetime. The peacetime is when we can reflect and turn our minds to examining what happened, what could happen again, and ask how we can prepare for the next crisis? Can we look at those interactions between animal health, human health and environment and see all the components? What should we focus on, do more research on, and what kind of data will help support these efforts? If you have managed a few emergencies, you always think, "now is probably not the right time for reflection," but

there will be time to reflect. I propose we should all be putting some effort into working on these areas in tandem.

One Health is not a new concept, but it has become more important in recent years. I think the areas of work in which the One Health approach is particularly relevant today is with zoonoses, the spread of disease between animals and humans, as well as with antimicrobial resistance, where the bacteria or the microorganisms change with exposure to antibiotics. One of the key components for me has been to look at these issues from every angle. A One Health approach is an important piece for me and for veterinarians in analyzing these issues.

**How have the values of veterinary medicine informed your work in your various roles in the public service and especially your role in health?**

Veterinarians must be compassionate when working with animals; you need decision-making and problem-solving skills, diagnostic and differential diagnosis skills, and interpersonal skills. These things build the spirit and the culture of integrity and excellence. They are the values any veterinarian carries.

These values have been similarly useful for me working

in the public service. When I worked for the Canadian Food Inspection Agency (CFIA), I led the response to the XL crisis, or the beef crisis, in Alberta. All these decision-making, management and problem-solving skills came into use during those challenges.

I went to Immigration Refugee and Citizenship Canada (IRCC) as an Assistant Deputy Minister in between my stint with the CFIA and Health Canada, and again, compassion was an important piece that helped me in my work. These experiences represented a total shift from science to social policy, but I took the interpersonal skills with me, and I took the compassion piece. We are weaving the fabric of Canada with people coming here from different countries. How are we compassionate about the refugees who are persecuted in their own countries, and acknowledge that they could be an asset to us? These values have translated to my work in public service.

I'm a results-oriented person, and I have found satisfaction in my careers in both veterinary medicine and public health. While I may not be doing veterinary surgeries or practicing differential medicine here, I am using a lot of the tools I learned in my training to be a good veterinarian in new ways.

**What advice do you have for DVM students who would like to follow a similar career path to yours?**

At one point in our career, each of us will come to a fork in the road. I came to the CFIA to develop regulations for food derived from cloned and transgenic animals. When they hired me, I asked, "Do you need a veterinarian to do that?" They said, "Yes, we need a veterinarian, and we need a PhD who knows animal biotechnology, and who knows about the techniques and the medicine. You fit the bill. We can teach you policy."

I joined the public service in 2002 and in 2008, I had to decide whether I wanted to stay in veterinary medicine and the science side of things or go into the management side of things. I decided very carefully that I couldn't just stay in science and veterinary medicine; I wanted to go into management. In a management role, you have the opportunity to advise others and provide guidance, and be a part of transformation and change. It elevates your ability to shape animal health in the future. So, for me, management provides an amazing opportunity for DVMs who

are coming out of school to consider regulatory medicine or a public service career; they can be really rewarding. And in my case, that decision allowed me new opportunities, and eventually brought me back full circle when I was appointed Chief Veterinary Officer for Canada in 2014.

There are many opportunities in public service. We have wildlife conservation, surveillance, the Public Health Agency where we do epidemiology, Health Canada, the Veterinary Drugs Directorate, and the CFIA, which employs probably 600 plus employees in areas across Canada. You can bring your skills to the forefront in a very different manner. There are veterinary positions abroad, veterinarians who use their skills in negotiating what is happening in terms of trade and other regulatory issues.

You have a chance to utilize your skills to advance both the economic focus of Canada, as well as the science agenda of Canada on an international scale. It really is a unique opportunity.

**Mentorship is such an important component of the veterinary community. Who has influenced you the most and why?**

I will start with Allan King, at the Ontario Veterinary College, who was a great supervisor, mentor and now a friend. As well, I had a formal mentor-mentee relationship with former Chief Veterinarian of Canada, Dr. Brian Evans, who was very influential in my career. When he was at the OIE World Organization for Animal Health, I was in constant conversation with him. I've been fortunate in public service, as I continued to grow; the different public sector leaders have been very generous with their time.

At Immigration, Refugees and Citizenship Canada (IRCC) and now

at Health Canada, I've worked with a good mix of people who have helped me understand my strengths and also point out where I need to improve. And that constructive critiquing has helped me a lot.

When I came to do my PhD with Allan, after finishing my first set of experiments, I asked what he thought I should do next? He said, "If I tell you what to do next, it won't make you a researcher. I want you to think about what you would like to do, what it would mean for you and what you will learn." Allan was trying to help me train my mind to be a good researcher. I realized afterwards what a strong message he had for me. He encouraged me to distill, analyze and come up with a couple of ideas about what to focus on. It helped me understand my challenge and find a solution. That, "I'm here to help you" approach is a great way of mentoring and coaching someone.

My learning has included immensely fruitful interactions with all the mentors I've had, and they influence me even now. If I see people who are doing things differently than I would do them, I try to establish contact with them even informally and ask, "Why have you chosen to do that in this way?" I'm not shy about asking questions. It is a means of constant learning for me.

**As a mentor yourself, could you talk about how you see your role in modeling leadership for underrepresented communities?**

I'll be honest with you, organizations are increasingly recognising the importance and benefits of being more inclusive. It is not a switch you flick and suddenly something changes. It needs to be a culture shift towards concrete changes in daily routines.

I'm very humbled to be in the situation I'm in. I think I'm the first person

**"In public service, you have a chance to utilize your skills to advance both the economic focus of Canada, as well our national scientific agenda on an international scale. It really is a unique opportunity."**

to wear a turban who's been appointed to a Deputy Minister rank. The first turban-wearing Sikh in the public service of Canada. I was probably the first turban-wearing Sikh who served as the Assistant Deputy Minister when I was in IRCC.

What has it done for me? It has made me proud. It's made my community proud and allowed under-represented people to look at me and say, "This guy can get there, we can too." But there is also immense pressure to be a role model for youth who are underrepresented. And to me, that is an important piece.

I tell my kids, "It's not because of how I look that I am here. It is about what I do that has brought me here." On top of this, there is a recognition that I am able to do it based on what I've achieved in life.

It has been an absolute pleasure to serve in public service. I feel very privileged to be a part of a very high-performing public service. To get to this point, you have to work hard, and you have to make sure you are delivering what is expected of you.

Many people describe their career in veterinary medicine as a calling from a young age. What led you to veterinary medicine? Was there a pivotal or 'aha' moment that inspired you to pursue a career in veterinary medicine?

The first three months into my studies, I was amazed by the knowledge that you need to gather so that you can be a good veterinarian. I remember at that time thinking, "What is the difference between my friend who is in medical school and me? He is learning about the anatomy and physiology of one person, a human being; I'm learning about five different species. I need to know five different ways physiology works, plus my patients are not able to tell me how they feel." I thought, "This is awesome."

I have never looked back. I am in love with veterinary medicine. I still maintain my license. This is close to my heart. I want to keep that connection with the animals. That is an important part of my career and my personality. 🌿

## OVC researchers launch new provincial mental health program for farmers

In early 2021, researchers at the University of Guelph's Ontario Veterinary College (OVC) launched a new mental health literacy-training program developed for agricultural communities.

Dr. Andria Jones-Bitton, OVC DVM 2000, a professor in OVC's Department of Population Medicine, and OVC's Director of Well-Being Programming, collaborated with Dr. Briana Hagen, OVC PhD 2020, to create the In the Know program to help farmers improve their mental health knowledge and build their confidence in recognizing mental health struggles, speaking to others, and helping others who are struggling.

The program covers topics such as stress, depression, anxiety, and substance misuse, as well as how to start a conversation around mental well-being. In Ontario, the program is run by the Canadian Mental Health Association (CMHA) Ontario, which enlists mental health professionals with agricultural backgrounds and/or partners them with members of the agricultural community to deliver the training to farmers, and individuals who work closely with farmers, in a four-hour session.

In order to meet the needs of farmers, Jones-Bitton and Hagen developed this training program in close collaboration with various agricultural sectors, mental health professionals, government and representatives from social work, psychology, and education.

An evaluated pilot of the In the Know workshop, spearheaded by Jones-Bitton

and Hagen in 2019, demonstrated success in increasing participants' mental health knowledge and literacy.

Now that the program is up and running in Ontario, Manitoba, Nova Scotia, Alberta, and British Columbia, Jones-Bitton and Hagen are identifying new partner organizations to facilitate making this training available in agricultural communities across Canada. French translation of materials is almost complete and Spanish translation is underway by request for seasonal agricultural workers.

This research on farmer mental health and well-being began in 2015 with funding from the Ontario Ministry of Agriculture, Food and Rural Affairs through the Ontario Agri-Food Innovation Alliance, Egg Farmers of Ontario, Ontario Pork, Ontario Sheep Farmers and the Ontario Federation of Agriculture.

"I think the real strength of this program lies in the collaboration that led to its development," says Jones-Bitton. "In the Know was developed with a wonderful team of farmers, agricultural industry and government representatives, and mental health professionals, which helped maximize relevance and uptake, and our research confirmed that it is effective. It is terrific to see the program being delivered in multiple provinces across Canada, and very soon - in multiple languages!" 🌿

# The science and *Art* of relationships

Alex Sawatzky has a passion for art and science.

"I work with both sides of my brain a lot of the time in the work that I do," says Sawatzky. "Doodling has always been a way of visualizing and processing information for me."

When she joined the Ontario Veterinary College (OVC) to pursue her PhD studies, Sawatzky pivoted her doodling into a unique approach to art and illustration that informed her research and continues to help her communicate concepts and themes to all kinds of audiences.

The first PhD graduate in Public Health in OVC's Department of Population Medicine, Sawatzky will tell you the journey with her research was all about relationships.

Sawatzky's PhD studies focused on developing an Inuit-led environment and health monitoring program with the community of Rigolet, Labrador, to use as they adapt to current and future climate change. Sawatzky's co-advisors, Dr. Sheri Harper, formerly a faculty researcher in OVC's Department of Population Medicine and now at the University of Alberta, and Dr. Ashlee Cunsolo, formerly at Cape Breton University and now at the Labrador Institute of Memorial University, had long-standing relationships and research partnerships with Rigolet Inuit.

During the final year of her undergraduate degree at U of G and the following summer, Sawatzky worked in Harper's lab. Her work in the lab with Harper and Cunsolo evolved into her PhD project.

As she built relationships with Rigolet Inuit and other partners involved in the research project, Sawatzky drew on her natural inclination to use art as a way of communicating and mobilizing the research. "I think the visual component came out because that's how I understand things."

She began by talking with the Rigolet Inuit about what health and well-being means, what the environment means in relation to well-being, and why it's important to track changes in the environment.

From these discussions, it became clear that "well-being" was about a connection to place, a sense of identity, purpose and belonging, and premised on relationships with the land.

"What do relationships with the land mean to this particular community? How does

that inform priorities in terms of developing responses to climate change?" Sawatzky asks. "These priorities are often determined by the specific relationships that people have with the places that are changing around them. Incorporating these place-based relational concepts into a public health monitoring program is essential, especially when we're looking at a big issue like climate change that affects everyone but affects everyone so differently."

Over the course of her research, each time Sawatzky returned to the community with a summary of previous conversations, she often brought accompanying visuals in the form of infographics. "We would talk about the visuals together, revising and shaping the direction of the research based on that. I think with visuals there is lots of room for expansion and playfulness and back and forth. I didn't want to impose my own interpretations, I wanted to say, 'here's what I heard you say. Is this a correct interpretation?' Using visuals as tools allowed me to shape and strengthen my research project and partnership with that community."

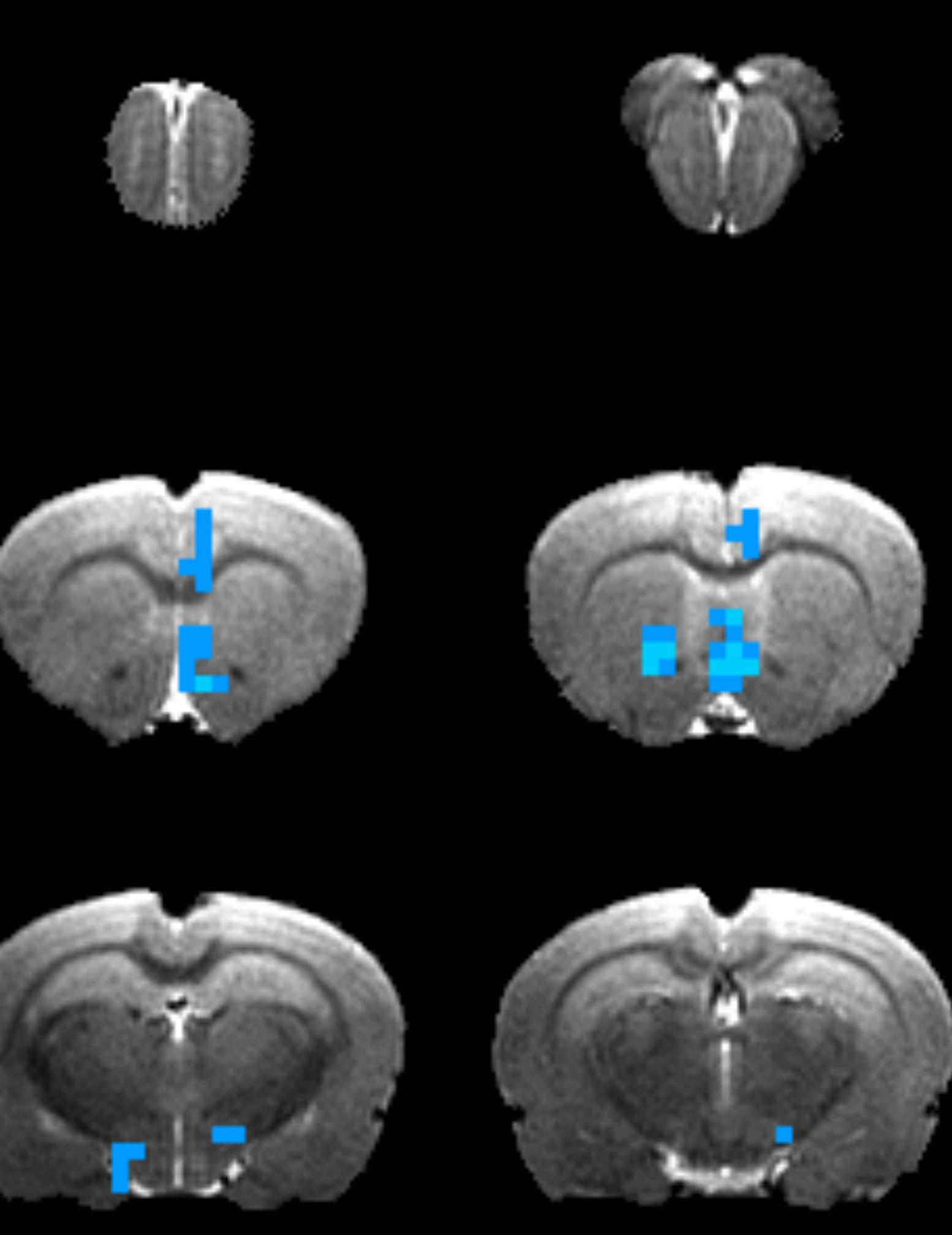
It's a partnership that continues to grow.

Sawatzky is again working with Cunsolo, who was recently appointed founding Dean of the new School of Arctic and Subarctic Studies at the Labrador Institute of Memorial University. Sawatzky is the Special Projects Manager for the Labrador Institute, helping to oversee the development and growth of the new School.

The School will provide programming that is Northern-led and focused. "There is huge value in creating and strengthening place-based educational programming, research, and infrastructure that honours Northern and Indigenous self-determination over what education can look like."

Ultimately, it comes back to relationships for Sawatzky.

"I think it's important to remember that research is always about relationships," she says. "And relationships don't always have to be among people. Even if you're working in a lab, you're building relationships with the specimens you're working with - they came from someone or somewhere, and they are helping you contribute and relate new understandings within a collective knowledge base." 🌿



# HOW UNDERSTANDING SUBSTANCE DISORDER MAY HELP SCHIZOPHRENIA TREATMENT

*IN PHOTO: Functional connectivity patterns in a rat model of schizophrenia show similar decreased connectivity of the brain reward circuit to those observed in humans with schizophrenia. Photo Credit: Dr. Jibran Khokhar.*

People with multiple ailments have complex treatment needs that prove challenging to practitioners – and to themselves. For example, research shows people affected by schizophrenia are three to 10 times more likely to have a substance use disorder (SUD) than the general public. In fact, medications used to treat schizophrenia can often worsen a patient's SUD.

Dr. Jibran Khokhar is an assistant professor within the Ontario Veterinary College's Department of Biomedical Sciences at the University of Guelph. Khokhar's research lies at the intersection between serious mental illness and drug addiction, a chicken-or-egg question that has proven difficult to answer. He is working to broaden the understanding of schizophrenia and SUD's effects on the brain.

Patients with schizophrenia have lifespans 10 to 25 years shorter than the general public. Evidence suggests this is mainly caused by high rates of drug use, says Khokhar.

His research focuses on understanding why SUD – dependency on nicotine, cannabis and alcohol – is so high in those affected by schizophrenia and how these substances interact to affect the brain. Khokhar will use this information to develop a more effective treatment for people with co-occurring schizophrenia and SUD.

"To improve outcomes, we need to start with understanding the reasons behind the increased prevalence of drug use and identify potential variations in brain activity," he says.

Researchers believe that people with co-occurring schizophrenia and SUD may have a dysfunction in the brain's reward system which leads to greater incidences of drug dependency.

However, this isn't the only driver. Elements of cannabis and nicotine might also alleviate cognitive deficits or anxiety disorders in these cases. This means patients may be self-medicating with cannabis or nicotine, says Khokhar.

His research seeks to answer how much of this behaviour is self-medication or how much is from a dysfunction in the brain's reward system.

To understand why patients with schizophrenia use drugs, Khokhar is studying the brain activity of rat models of schizophrenia that consume alcohol, cannabis and nicotine using functional magnetic resonance imaging, or fMRI. The rat's brain shows similar changes to those observed in patients with schizophrenia. This understanding of brain activity in those with co-occurring schizophrenia and SUD will hopefully lead researchers to develop better treatment options without amplifying the SUD.

"Current research tells us that there is a relationship between SUD and schizophrenia. But we don't yet know if SUD increases the risk of schizophrenia or if schizophrenia predisposition increases the risk of SUD," he says.

Khokhar is exploring genetics for a possible answer. Next steps include analyzing genetic variations that would predispose a person to schizophrenia or SUD to find the relationship. Khokhar is also looking into the concurrent use of cannabis with nicotine or alcohol during adolescence. The research will assess the short-term and long-term effects of multi-substance use on memory and learning.

This work was funded by the Canada Foundation for Innovation and Canadian Institutes of Health Research. 🇨🇦

Researchers at the University of Guelph are examining how outdoor air pollution, or smog, affects the respiratory health of horses in the Guelph-Kitchener-Waterloo area.

In humans, increased air pollution – specifically the presence of fine particles, nitrogen dioxide, and ozone – is known to play a role in the development and triggering of asthma. Dr. Janet Beeler-Marfisi, a professor in the Department of Pathobiology at the Ontario Veterinary College (OVC), is researching whether the same factors play a similar role in the development of mild equine asthma (MEA) in horses.

Mild equine asthma, accompanied by symptoms like intermittent cough and increased numbers of inflammatory cells in the lower airways, is common in young sport horses, and its effects are particularly problematic for racehorses. As racehorses are elite athletes, any decrease in lung health, such as cough or inflammation, has a significant negative impact on athletic performance. Beeler-Marfisi's interest in smog and MEA stems from her own struggles with asthma and her love of Standardbred racehorses.

"The role of air pollution hasn't been fully investigated in horses," says Beeler-Marfisi. "We wanted to determine if a relationship exists between increased air pollution or temperature and asthma in horses." The Ontario government has a tool called the Air Quality Health Index (AQHI) that can be used to determine how much outdoor activity is safe for humans when air pollution, and the associated AQHI, are high. "We wanted to see if the AQHI could be used by horse trainers to predict when they should avoid high intensity training in order to protect their horse's lung health."

The research team retrieved records from cases at the Animal Health Laboratory at the U of G in which cell samples had been taken from the horses' lower airways. They pared down the data to make sure that the samples were taken from horses in specific geo-

graphic regions with similar air quality and that had reliable weather and air quality recording programs.

From there, the team looked at the meteorological data corresponding to the time that certain horses developed lung issues to see whether temperature also affected the horses.

Beeler-Marfisi's research group identified 154 Standardbred racehorses with records that fit their criteria. Of these, 78 cases had increased levels of lung inflammatory cells. On average, the horses were four years old, which is young. This means that 51 per cent of the racehorses in the Guelph-Kitchener-Waterloo area had MEA during this 10-year period – which is high and means that these horses could have had reduced athletic performance as a direct result of exposure to air pollution.

Although it is unclear exactly how temperature affects asthma in humans, increased ambient temperature was another risk factor for the development of MEA in horses.

These findings support the idea that inflammation of the respiratory tract in horses develops in a similar way to asthma in humans in response to air pollution.

"This is the most comprehensive study investigating the relationship between outdoor air pollution and lung inflammation in horses. And it's the first to examine the association of the AQHI with horse lung health" says Beeler-Marfisi. "Our results expanded on the current understanding of how exposure to higher air pollution can affect the health of horses in the Guelph-Kitchener-Waterloo area, and has identified air pollution as an important target for future research in MEA and other lung diseases of horses." 🐾

*This research was funded by a grant from Equine Guelph.*

# THE IMPACT OF AIR QUALITY ON HORSE HEALTH

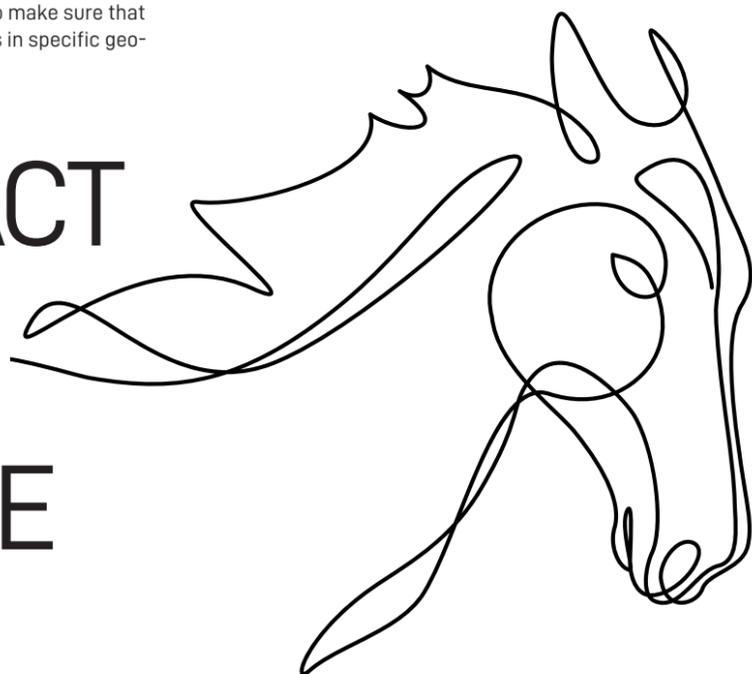


Photo credit: istock.com/TetianaGarkusha (left); istock.com/723dau (right).

# COWS+ CLIMATE CHANGE

## How environmental changes are impacting the dairy industry

Researchers at the Ontario Veterinary College (OVC) are working to identify dairy cattle that are genetically resistant to heat stress and better able to withstand the issues associated with climate change.

Climate warming presents numerous environmental challenges, including more frequent extreme weather events such as heat waves.

Climate change is anticipated to significantly impact the Canadian agricultural industry, as livestock struggle to adapt to constant changes in environmental conditions. Dairy cattle are especially affected as they have been identified as one of the most prone livestock species to elevated temperatures and high humidity.

Heat stress in cows occurs when they generate and absorb more heat than they can easily get rid of through respiration or sweating. When exposed to heat stress, dairy cattle can face reproductive issues, reduced milk production, and increased health issues.

Shannon Cartwright, a PhD candidate in OVC's Department of Pathobiology, is leading research to identify dairy cattle that are more thermotolerant – or resistant to heat stress – and thereby resilient to climate change. Cartwright hopes her research will address the problems associated with heat stress for

dairy cattle, as well as help to alleviate the pressure of climate change on the dairy industry as a whole.

"I have always been passionate about the dairy industry and finding ways to help dairy producers and cattle," says Cartwright. "If we don't identify animals that are resilient to heat stress, we will face increasing issues with dairy cattle as our climate continues to warm."

Cartwright is advised by Dr. Bonnie Mallard, the inventor of the High Immune Response and Immunity+ technologies that identify naturally healthier cows with

**Dairy cattle are especially affected by climate change as they have been identified as one of the most prone livestock species to elevated temperatures and high humidity.**

optimized immune responses. It has been shown that these 'high immune responders' have lower disease incidence, improved vaccine response and better hoof health.

Based on these findings, Cartwright and her team "wanted to determine if we could also see variability among cattle evaluated for immune response in their response to heat stress." Their research has shown these high immune responding cattle are likely to be more

resilient to heat stress than low immune responders, but now, Cartwright wants to identify why high immune responding dairy cattle may be more resilient to heat stress.

So far, Cartwright has shown that high immune responding cattle produce a greater number of molecules that protect their cells during heat stress events compared to average and low immune responding cattle. Heat stressed high immune responding cattle may also exhibit increased expression of genes related to cellular protection when compared to low responders.

Cartwright's most recent publication demonstrated that high immune responding cattle exhibit increased proliferation of cells of the immune system during heat stress, which could help to protect against invading pathogens and likely reduce disease incidence. She is now investigating whether differences in cellular metabolism between high and low immune responders may be the reason why high immune responders seem to be more resilient to heat stress.

"It is important to understand the mechanisms that may be contributing to heat stress resilience in high immune responders so that we can better understand the biological differences between different immune response phenotypes," says Cartwright. 🐾

*This research was supported by the Canadian First Excellence Research Fund, Food From Thought, Dairy Farmers of Ontario, and the Ontario Veterinary College.*

# 2021 CONVOCATION

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Andrea Nicole Chivers  
Andrew Peter Rice Conlon  
Natalie Alexandra Cook  
Cecilia Lynn Creighton  
Alicia Dagg  
Matea Joanne David-Steel  
Jessica Lynn Davison  
Jessica Shea Dawley  
Maria Dawod  
Enise Ruth Anne DeCaluwe-Tulk  
Megan Michelle Donati  
Emily Quin Drinkwater  
Tasmin Elizabeth Dunkin  
Devon Marcie Edwards  
Bret Lauren Flynn  
Benjamin Myles Fuller  
Meredith Garcia  
Alexandre Geduld-Boucher  
Amanda Dorothy Margaret Gordon  
Cassandra Allison Laura Gorrill  
Kayla J. Gradil  
Caroline Sophie Graefin Von Waldburg-Zeil

Blake Nicholas Grootenboer  
Allison Noelle Hall  
Danielle Erin Harding  
Leah Heldman  
Bradley Christopher Henderson  
Emily Kate Hill  
Jessica Lee Hoekstra  
Aiyanna Joy Hoogsteen  
Stephanie Sarah Hookey  
Taylor Cameron Hull  
Kiana Nicole Hylton  
Roseann Elizabeth Kehoe  
Timothy Jacob Kennedy  
Bavitra Ketheeswaran  
Kayla Kim  
Mackenzie James Klapwyk  
Lisa Marie Kril  
Georgia Kritikos  
Fiona Vicki Kwok  
Brian Lawrence Ogilby  
Stephanie Ann Louie  
Christina Marie Lucas  
Virginia Ivy Madsen  
Emily Ellen Olivia Mann  
Natalie Danielle Martic  
Erika Masters  
Olivia J. Mazurek  
Peter Daniel Lee McBride  
Sara Dawn Jean McNamara  
Ciara Janssen Reese McPhedran  
Martin Kenneth Metzger  
Daniel Patrick Basque Minardi  
Melanie Frances Montague  
Esther Yeji Moon  
Melanie Allana Moore  
James Andre Joseph Mori  
Taylor Elizabeth Morris  
Mahsa Nasser  
Michaela Naugle  
Celeste Rhianna Noble  
Lindsay Erin Ormesher  
Leah Robin Griffiths Partlow

Shelby Near Paulseth  
Christina Petri  
Irena Kamenova Peytchev  
Leah Heldman  
Monica Rose Pisani-Konert  
Nancy Marianna Poremba  
Adam Stephen Quinlan  
Mikkyla Maddison Winnifred Lovett Reid  
Rebecca Leigh Reid  
Heather Nicole Reinhardt  
Madison Noelle Rier  
Valeria Roati  
Joy Alexa Russolillo  
Amanda Santarossa  
Tiffany Mae Scherrer  
Amy Alissa Schut  
Lauren Keiko Sergejewich  
Larisa Lumen Silveira  
Erika Jean Sjolun  
Nicole Elizabeth Socie  
Kaitlin Julia Sparkman  
Briana Alexandra Spratt  
Devon Patricia Stober  
Yuqing Sun  
William Emmett Swanton  
Erin Courtney Go Sjujeco  
Hannah Kathleen Bottomley Thompson  
Brenna Kathleen Tuer  
Paige Elizabeth Ann Urban  
Emily Ann Van Bommel  
Derek Anthony Van de Walle  
Alicia Victoria Vancasteren  
Kyla Elenore Von Hausen  
Kathryn Ann Wagnitz  
Victoria Anne Waind  
Shining Wang  
Amy Lynn Westlund  
Courtney Kimberly Winkels  
Kristopher Afshaun Zaman

### GRADUATE STUDENTS

**DOCTOR OF PHILOSOPHY**  
**PATHOBIOLOGY**  
Peyman Asadian

**POPULATION MEDICINE**  
David Borish  
Angelina Bosman  
Konrad Lisnyj  
Tara Sadeghieh

**DOCTOR OF VETERINARY SCIENCE**  
**CLINICAL STUDIES**  
Shannon Wainberg

**PATHOBIOLOGY**  
Siobhan O'Sullivan

**MASTER OF PUBLIC HEALTH**

Muhammad Abid  
Anit Bhattacharyya  
Taylor Colangeli  
Ariana Del Bianco  
Elohor Enawworhe  
Alexandra Fracz Julie Gill  
Joshua Grignon  
Robyn Haas  
Advina Kamaric  
Brianna Kinahan  
Natalie Kobayaa  
Kirstin Loates  
Justice Luddington  
Hana MacDonald  
Sarah Martone  
Sophia Neumann  
Robert Northcott  
Violetta Reznikov  
Sinthiya Selvaratnam  
Aishwarya Shah  
David Sheehan  
Lauren Sherk  
Hailey Silver  
Shannon Thom

**MASTER OF SCIENCE**  
**BIOMEDICAL SCIENCES**  
Julia Pacosz  
Philip Russell

**CLINICAL STUDIES**  
Christopher Drolet  
Hannah Godfrey  
Masayasu Ukai

**PATHOBIOLOGY**  
Laura O'Shaughnessy-Hunter  
Christine Yanta

**POPULATION MEDICINE**  
Janelle Morrison

**MASTER OF BIOMEDICAL SCIENCES**  
Stephanie St. Jules



### CELEBRATING OUR GRADUATES' AWARDS, HONOURS AND ACCOMPLISHMENTS

#### 50s

Dr. Roland "Roly" Armitage, OVC DVM 1951, has been awarded the Order of Ontario, the province's highest honour, recognizing individuals whose exceptional achievements will leave a legacy in Ontario and beyond.

Dr. Bruce Fogle, OVC DVM 1970, recently published *Call the Vet: My Life as a Young Vet in 1970s London*.

Dr. Barry Heath, OVC DVM 1972, recently published *Odyssey and Shammy Go to School*, a book about guide dogs in Canadian society.

University Professor Emerita by the University of Guelph.

Dr. Scott Weese, OVC DVM 1996, Director of the U of G's Centre for Public Health and Zoonosis and a veterinary internal medicine specialist in OVC's Department of Pathobiology, was inducted as a Fellow with the Canadian Academy of Health Sciences (CAHS). CAHS Fellows are world-renowned leaders and innovators who have a history of outstanding performance in the academic health sciences in Canada.

University Professor Emerita by the University of Guelph. Stone served as the 10th dean of the Ontario Veterinary College.

Drs. Dorothee Bienzle, OVC DVM 1988, in OVC's Department of Pathobiology, and Jan Sargeant, OVC DVM 1986, in OVC's Department of Population Medicine, were recognized with Research Leadership Chairs. Created by the U of G's Office of Research and the Office of the Provost, the Research Leadership Chairs program recognizes research excellence of well-established faculty who have proven records of distinguished and sustained scholarly work with significant national and international recognition.

New faculty joining the Department of Clinical Studies include: Drs. Roxanne Buck; Allison Collier, OVC DVM 2017; Nicola Cribb; Caitlin Grant, OVC DVM 2014; and Amy Lack.

New faculty joining the Department of Pathobiology include: Drs. Graziela Maboni; Heather Murphy, Canada Research Chair in One Health; Courtney Schott, OVC DVM 2012; Mauricio Seguel; and Sam Workenhe.

Drs. Basem Gohar and Kelsey Spence, OVC PhD 2017, joined the Department of Population Medicine.

#### 60s

Dr. Ian Barker, University Professor Emeritus, OVC DVM 1968, in OVC's Department of Pathobiology, was named an Honorary Member of the American College of Veterinary Pathologists recognizing his outstanding contributions to the discipline of veterinary pathology.

Dr. Carlton Gyles, OVC DVM 1964, University of Guelph Professor Emeritus in OVC's Department of Pathobiology, retired as the editor-in-chief of *The Canadian Veterinary Journal* after holding the post for more than 12 years.

#### 80s

Dr. Corrie Brown, OVC DVM 1981, received the American Association of Veterinary Medical Colleges 2021 Billy E. Hooper Award for Distinguished Service, presented to an individual whose leadership and vision has made a significant contribution to academic veterinary medicine and the veterinary profession.

Dr. John Deen, OVC DVM 1984, received the 2021 Howard Dunne Memorial Award from the American Association of Swine Veterinarians for his contributions and outstanding service to the association and the swine industry.

#### 00s

OVC DVM 2000 alumna Dr. Mary Jane Ireland has been named Chief Veterinary Officer for Canada and will also serve as Canada's new delegate at the World Organization for Animal Health (OIE).

#### OVC COMMUNITY

Dr. Éva Nagy, a professor in OVC's Department of Pathobiology, was named University Professor Emerita by the University of Guelph.

Dr. Elizabeth Stone was recognized as a Univer-

#### 70s

Dr. Geoffrey Cochrane, OVC DVM 1976, was granted board certification as a Diplomate of the American College of Animal Physiology with Companion Animal Species specialization.

#### 90s

Dr. Patricia Turner, OVC DVM 1992, a professor in OVC's Department of Pathobiology, was named

### PASSAGES

#### 40s

Dr. Ken Hartin, OVC DVM 1949, passed away on January 21, 2021.

#### 50s

Dr. Torgny Fredrickson, OVC DVM 1955, passed away on April 7, 2020.

Dr. Ronald S. Horning, OVC DVM 1955, passed away on May 25, 2021.

Dr. John Gordon Hill, OVC DVM 1956, passed away on January 16, 2021.

Dr. Jeanne Ikeda-Douglas, OVC DVM 1957, passed away on May 9, 2020.

Dr. Donald Stewart MacDonald, OVC DVM 1957, passed away April 24, 2020.

#### 60s

Dr. Bob Hinton, OVC 1961, passed away on March 26, 2020.

Dr. Andrzej (Andy) Kolski, OVC DVM 1961, passed away on June 17, 2020.

Dr. Paul Fanjoy, OVC DVM 1964, passed away October 27, 2020.

Dr. David John Gregory, OVC DVM 1965, passed away April 22, 2020.

Dr. Gordon Finley, OVC DVM 1967, passed away on November 12, 2019.

Dr. Gerdina Verwey, OVC DVM 1967, passed away on February 3, 2019.

Dr. Lloyd Wieringa, OVC DVM 1967, passed away on February 11, 2021.

Dr. Harry G. Pearce, OVC Phd 1968, passed away in November 2019.

Dr. Wolfgang Lixfeld, OVC DVM 1969, passed away July 18, 2021.

#### 70s

Dr. Brian Westgarth-Taylor, OVC DVM 1975, passed away on January 10, 2020

#### 80s

Dr. Ronald Mergl, OVC DVM 1985, passed away on July 4, 2020.

#### 90s

Dr. Melanie (nee Fisher) Grein, OVC DVM 1991, passed away on September 27, 2020.

#### 00s

Dr. Tom Gutteridge, OVC DVM 2013, passed away on August 4, 2020.



## THE INTRODUCTION OF THE DASIE

In 1991, OVC Small Animal Surgery Professor David Holmberg developed a model for surgical teaching called the Dog Abdominal Surrogate for Instructional Exercises (DASIE). DASIE continues to help teach the

principles of abdominal surgery, including abdominal draping, aseptic technique, use of surgical instruments, and the fundamentals of tissue handling, without the use of animals. This experiential learning model has

been integrated into many undergraduate veterinary surgery programs throughout the world. 🐾

*Excerpt taken from: Milestones: 150 Years of the Ontario Veterinary College*

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Attention: OVC Marketing Communications,  
OVC Main Building, Dean's Office

## COMING EVENTS

### OVC PROFESSIONAL WELCOME CEREMONY

OVC Class of 2025  
October 2, 2021

### OVC STUDENTS ANIMAL WELFARE CLUB

Animal Welfare Forum  
October 2021

Update your email contact information at [alumnirecords@uoguelph.ca](mailto:alumnirecords@uoguelph.ca) so we can keep you up-to-date on future events.

Did you know Alumni Affairs helps organize class reunions? Find more information at [www.alumni.uoguelph.ca/alumniweekend/reunions](http://www.alumni.uoguelph.ca/alumniweekend/reunions) or contact OVC's Alumni Advancement Manager, Amy Tremaine at [tremaina@uoguelph.ca](mailto:tremaina@uoguelph.ca) or 519-824-4120 ext. 56679.

The University of Guelph, and by extension OVC, is a registered charity. Your contribution can support the area of your choice or OVC's highest priority at the time. Visit our giving page at [ovc.uoguelph.ca/give](http://ovc.uoguelph.ca/give). Tax receipts are provided.

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